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# **Social Cartography and 'Knowing Capitalism': Critical Reflections on Social Research and the Geo-Spatial Web**

**By**

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## **Introduction**

This chapter explores how, what Thrift (2005) has termed *knowing capitalism*, is increasingly invested in developing new techniques, methodological frameworks, and cultural discourses that exploit the potential of social cartography to realize new forms of economic value and analytical power. Social cartography is defined here as an analytical concept that encompasses new cartographic information practices specifically derived from non-expert epistemologies and everyday users of new interactive mapping technologies, platforms, and software. Although there are many sites, case studies, and applications for this new social cartography, of specific interest to us here is exploration of the development of the geo-spatial Web 2.0 (the Geoweb) that combines interactive map-making with crowdsourced, volunteered, and open data practices. This chapter therefore explores the emergence of the Geoweb by examining its genealogical connections with knowing capitalism through a critical examination of its rhetorical, cultural, and politico-economic approaches to social cartography. The rationale of the chapter is to stimulate future research into how these new geo-spatial tools can offer social scientists new methodological approaches to doing research, while also scrutinizing the underlying political economies of knowing capitalism that consider how the diffusion of cartographic literacies and data is embedded in a neo-liberalization of empirical research.

Geographic Information Systems (GIS) typically require years of training in software such as ArcGIS or QGIS, as well as access to expensive data sets licensed by the private sector. By contrast, the Geoweb is perceived to signal a social diffusion of cartographic knowledge production in everyday life that leverages the vernacular information practices and non-expert information literacies. This diffusion echoes larger structural changes in the social relations of new media information practices that coalesce around the value of crowdsourcing and social production; for example, geotagged social media in the wake of natural disasters such as the 2012 'superstorm' Hurricane Sandy, or Crampton *et al.*'s (2013) analysis of the geography of tweets that used the specific hashtag #LexingtonPoliceScanner. The rationales for producing new forms of civic participation and community engagement,<sup>2</sup> crisis management, and other critical epistemologies of social stratification stress the value of non-expert knowledge. However, this is not to suggest an oversimplification; that the Geoweb represents some kind of antithesis to knowing capitalism - far from it. An overview of its political economy shows how the Geoweb emerged in tandem with knowing capitalism, specifically through its shared social history with the neoliberalization of geo-spatial infrastructures. The Geoweb is embedded in larger political economies of, what has been termed, 'commercial sociology' (Burrows and Gane, 2006) that commodify specific kinds of geo-spatial data into social knowledge that has market potential

and, thus, exacerbates the institutional distinctions and distributions of intellectual and economic capital necessary for conducting research. New questions and discourses around methodological reliability and validity therefore begin to surface, and position the Geoweb as a boundary object between, on the one hand, grassroots community praxis through vernacular epistemologies, and, on the other, the processes of capital accumulation realized from the commercialization of empirical sociological and geo-spatial research.

This chapter responds to the observation of a growing 'crisis' in empirical sociology caused by the emergence of commercial sociology and consumer analytics through big data infrastructures. It is divided into three sections. First, it examines the 'spatial turn' in sociology to trace the theoretical discussions around knowing capitalism and the crisis of empirical sociology since the publication of the first edition of this volume. In doing so, we focus specifically on the tensions between epistemological conventions of validity with ethical dilemmas of pragmatic research, and how these are causing irreversible shifts to spatial perceptions.

The second section examines the epistemological and cultural frameworks that define the Geoweb as social cartography and as a new set of practices for extracting value in knowing capitalism. This analysis is also characteristic of neoliberal methodological frameworks that configure geo-spatial research within a performative logic of social media interactivity and information exchange. This kind of research, in other words, necessitates a methodological principle that clearly articulates explicit social, political, economic, or cultural objectives. Interactivity with geo-spatial media therefore becomes embedded within a neoliberal individualization of social research, and in much the same way that characterizes much of the rationale of social media.

Finally, the chapter will introduce some basic Geoweb tools and applications used in contemporary geo-spatial research. The purpose here is to identify tools that may be relevant for social scientists interested in learning about the potential of the Geoweb for stimulating new research, civic participation, governance, and praxis. Two tools in particular will be explored in order to contrast the potential of the Geoweb for research and praxis: Ushahidi, a crowdsourced platform for disaster response and crisis management mapping; and CartoDB, a commercial Software as a Service (SaaS) platform that exploits big data infrastructures through economies of scale. In so doing, we hope to demonstrate how knowing capitalism has become multi-faceted in scope, method, and discourse. The particular nature of power, in other words, cannot simply be reduced to a linear analysis that exclusively privileges institutions of capital; new ways of producing social knowledge through geo-spatial tools may actually work concurrently and in contradistinction to the grand narratives of neoliberal capitalism.

## **Part 1: A Crisis of Knowing?**

The first edition of this volume critiqued the methodological distinctions of sociological research between academic and commercial institutions by framing new spatial tools for doing social research within a larger political economy of 'knowing capitalism' (Thrift, 2005), and the

supposed 'coming crisis of empirical sociology' (Savage and Burrows, 2007; 2009). It was argued that the production of empirical knowledge by sociologists employed by academic institutions was being superseded by commercial organizations that exploit sociological methods for the generation of economic value. The work of academic sociologists, thus, increasingly became less important when compared to the analytical powers of knowing capitalism. At stake was a political concern for authority and legitimacy over a set of empirical methods that academics once perceived to claim jurisdiction over. This methodological privilege assumed largely altruistic beliefs around the value of sociological knowledge for realizing beliefs of social change and empowerment by marginalized communities and social forces. Correspondingly, the real danger was the displacement of empirical research (particularly quantitative research) into the hands of commercial sociologists interested almost exclusively in leveraging social research for economic ends. Here, inequalities are effectively re-inscribed through hierarchical forces that govern the distribution of social resources and privilege, and became manifest through methodological discourses of epistemological jurisdiction and authority over the production of social knowledge. In Thriftian terms, various commercial objectives for targeting and influence become the imperative of knowing capitalism.

This controlled commercialization of research methods was evidenced most notably in the development of Internet Based Neighbourhood Information Systems (IBNIS): geo-spatial tools and GIS that classify populations through a complex of multivariate data sets into discrete geodemographic clusters (Burrows and Gane, 2006; see also Harris *et al.*, 2005). Using postal codes as a spatial grid for visualizing socio-economic distributions, geodemographics can exploit public census and private sector data to typify and classify populations into discrete market segments primarily to influence beliefs and behaviours, in turn creating new socio-economic distinctions of social stratification and class conflict that reflect institutional objectives. In Canada and the United States, the PRIZM segmentation system uses postal and ZIP codes to divide the population into 66 discrete segments. The United Kingdom uses a similar system, MOSAIC, developed by Experian, that divides the population into 67 segments. Geodemographics are in effect deeply symbolic practices of material and cultural distinction that stratify populations into spatial clusters based on their propensities, lifestyles, and tastes (Bourdieu, 1984). In doing so, geodemographics function to reproduce social, economic, and cultural distinctions through spatial segmentation and clustering. In Bourdeusian terms, geodemographics enact hierarchies of symbolic violence and market worth that structures the distribution of social and economic resources. Geodemographics work precisely because they are designed to accomplish pragmatic goals, all under the cultural and normative axiom: "you are where you live".

Geodemographics align with a performative logic of knowing capitalism by enacting markets into coherent segments of clearly definable ideal types. This allows for increasingly sophisticated techniques of population management and strategies of resource distribution by typifying people into discrete clusters of worth. Uprichard *et al.*, (2009) argue that the epistemological and methodological aspects of geodemographic classifications are directly related to a performative logic of capital. They work because they are designed to work for the purposes assigned by the classifiers developing these systems of knowing. Epistemological

conventions of reliability and validity, in effect, take an ancillary role in favour of key performance indicators that assess the their capacity for goal-rational performance and efficiency. This means that geodemographics are largely determined, first, by the specific data points chosen, as well as the underlying rationales that form the discourse of coding space into a form of analytical power.

However, this discourse of coding space is not necessarily exclusive to institutional agents of capital. Of particular importance here is to understand how new technologies and software exist alongside a larger popularization of cartographic literacies and interactive geo-spatial media by non-experts. The first edition of this chapter noted how the particular way of producing social knowledge through maps is not necessarily exclusive to Web 2.0 interfacing. Abrams and Hall (2006) argue that 'new cartographies' were already emerging that diffused cartographic understandings and sense making onto everyday life that had come to represent a new cartographic turn in the social sciences. This they connected to a longer theoretical argument developed in Fredrick Jameson's (1984) cognitive aesthetics based on the supposed incapacity for individuals to intuitively comprehend the de-centered nature of subjectivity within larger global socio-economic and cultural contexts (Toscano and Kinkle, 2015). A more recent application is in the data visualization of coders to mashup data and showing these as interactive spatial content. For example, the mapping of data by the Energy Information Administration from the United States Clean Power Plan to visualize the most common sources of fuel (Muyskens *et al.*, 2015).

The necessity to develop new aesthetical knowledges of spatial subjectivity highlights the role maps play in everyday information practices and sense making (cf. Savolainen (2008) for a more in-depth discussion on research around everyday information practices). Out of the speculation that empirical sociology might be in a state of crisis of distinction and authority, numerous discussions have surfaced that either acknowledge or critique this claim. Crompton (2008), for example, published an editorial response for the British Sociological Association arguing the real crisis stems from a lack of expertise and formal training in quantitative research methods. As sociology attempts to position itself as an authority, and thereby influence the power structures of social relations, the primary issue is a lack of skilled quantitative sociologists. These concerns were also expressed in the same issue of *Sociology* in Payne's survey of sociological methods (2008; see also Payne and Williams, 2005; Payne et al., 2004; Erikson 2005) that showed how the vast majority of sociological research is dominated by qualitative studies.

The perceived decline of quantitative empirical research in academic sociology<sup>3</sup> is therefore in many respects made worse by the proliferation of commercial sociology that often (but not always) relies on sophisticated multivariate analysis (as in the case of geodemographics) done by highly skilled researchers equipped with large quantities of statistical data or now, increasingly, access to 'big data' infrastructures (Savage and Burrows 2009; Burrows and Savage 2014; Mosco 2014). Such commercial sociology is also not bound by the same ethical oversight that pertains in much of the academy that routinely scrutinizes research proposals through a centralized bureaucracy and normative philosophy of risk management. It is possible then that

commercial sociology is able to produce new forms of knowledge through ethical de-regulation. As big data analytics continues to gain momentum, it is therefore worth considering how the crisis of empirical sociology might become further amplified as the distinction between methodological validity and economic performance becomes increasingly blurred, or worse, dismissed as irrelevant.

A compelling example of these kinds of tensions came to a boiling point in both public and intellectual discourse with the publication of a study on 'emotional contagion' by researchers employed by *Facebook* and Cornell University. The study explored how the emotional responses of Facebook users could be discreetly manipulated over time, causing audiences to internalize and even reproduce the emotional nature of social media content (Kramer *et. al.*, 2014).

The 'experiment' leveraged an extremely large sample (N=689,003) over a week, and manipulated exposure to 'negative' emotional expressions in user newsfeeds and measured the extent of similar emotional reproduction. Results showed that consistent exposure to negative emotional content could cause users to post content with a similar emotional nature. The same results were found when users were exposed to 'positive' emotional content, as well as content with no perceived emotional connotations. The significance of this study remains contested, but suggests that affective states can be reproduced by other users through controlled information exposure. Public response to this study was mixed, but focus on the ethical implications for social media companies like *Facebook* (guided of course by imperatives of marketing acquisition and conversion) to influence the patterns of information production and sense making to realize particular economic objectives. Beyond the Huxleyian potential for audience inculcation, many were also quick to address the practical potential for extracting economic value by discreetly influencing consumer behaviours and attitudes. As one journalist from *Forbes* observed:

What harm might flow from manipulating user timelines to create emotions? Well, consider the controversial study published last year (not by Facebook researchers) that said companies should tailor their marketing to women based on how they felt about their appearance. That marketing study began by examining the days and times when women felt the worst about themselves, finding that women felt most vulnerable on Mondays and felt the best about themselves on Thursdays (McNeal 2014).

The reporter continues by speculating on the extent to which social media might enhance such abilities for audience targeting and conversion based on the temporal nature of social media interactivity, speculating that this will ultimately become a routine practice of social media:

The Facebook study, combined with last year's marketing study suggests that marketers may not need to wait until Mondays or Thursdays to have an emotional impact, instead social media companies may be able to manipulate timelines and news feeds to create emotionally fueled marketing opportunities (Ibid).

For sociologists, the challenge is to address how their particular expertise can likewise engender processes of social change that do not exclusively serve the institutions of capital accumulation or audience exploitation. The 'real' crisis of empirical sociology is therefore not simply a methodological distinction of jurisdictional authority and expertise, but concerns about how research can accomplish specific objectives of exploitation and profit by those privy to new forms of data collection and analytical power, as well as the simultaneous political economy of information access and literacy wherein academics are increasingly seen as data illiterate and politically fragmented. Quantitative methods, typically grouped into descriptive and inferential studies, may now require that we acknowledge of a new set of methodological objectives based on how the analytical powers of knowing capitalism enact subjective aesthetics and performances. For academics, the question is then about how these new tools can be leveraged for social alterity and praxis that do not necessarily reproduce institutional hierarchies of distribution and privilege. At the same time, such a question continues to stress the discursive nature of power/knowledge whereby academic epistemologies stress the theoretical importance of their discipline, but in turn may risk reifying conventions of intellectual privilege over the field of social life itself.

## **Part II: The Geoweb as Social Cartography**

The questions and dilemmas we have posed are clearly beyond the scope of one chapter, but it is worth further considering the extent to which new geo-spatial infrastructures can realize alternate objectives and rationales for producing knowledge. One possible answer is the emergence of geo-spatial tools that utilize principles of crowdsourcing, open data, mashups, and Web 2.0, although it is of course necessary to highlight that this is not being framed through technological determinism. These new geo-spatial interfaces do not require years of intensive training in formal GIS such as ArcGIS or QGIS . Collectively, this is referred to as the geo-spatial Web 2.0, and denotes the emergence of new mapping technologies, as well as new cartographic literacies used routinely by everyday populations for a variety of innovative applications for creating and sharing personalized maps. These include community activism, civic participation, municipal governance, disaster and emergency crisis mapping, as well as using geo-spatial media to understand local environmental issues—all of which define the particular nature of social problems embedded in larger structures and forces of globalization. The Geoweb effectively represents a new form of social cartography that capitalizes on vernacular understandings of space through interactive, mobile, and ubiquitous cartographic media. Collectively, this may offer the potential to realize new social truths about complex socio-geographical issues and power struggles, and include a new agile software approach to better respond to evolving revisions for user requirements.

However, such beliefs are complicated by political economy, whereby the beliefs and values of digital humanitarianism and social justice are contrasted by issues of audience labour, information access and ownership, as well as with the potential for realizing highly intrusive forms of surveillance and social sorting (Lyon, 2003). Here, the Geoweb represents an extension of knowing capitalism, particularly as it intersects with processes of commodification and ownership (Smith, 2014). In this light, efforts to address data literacies by vernacular epistemes

of bottom-up social cartography must be considered within overarching market forces of economic and cultural production. Social cartography is actually antecedent to the Geoweb (Paulston, 1996), but what has changed, and makes the Geoweb unique, is the intersection of political and cultural economy that frame the beliefs and practices of geo-spatial knowledge production to accomplish political objectives of knowing capitalism. In our view, this requires a new resurgence of critical discourse and research to properly understand the capacity of interactive maps for new forms of social research, education, and praxis.

This second part will set out the Geoweb as an emerging form of social cartography by exploring its epistemological and cultural frameworks of knowledge production. Next, it will provide a brief overview of the political economy of the Geoweb to understand the structural forces and social relations of production. The contention of this section is the power afforded by the neoliberalization of geo-spatial infrastructure and knowing capitalism is contingent on the power relations that structure its production. The Geoweb is politically, economically, and culturally heterogenous. It is impossible to reduce the Geoweb as exclusively an instrument of knowing capitalism, nor of grassroots praxis; ultimately, it depends on the social relations of information production, access, literacy, and ownership.

### **Cultural Epistemologies**

The Geoweb mobilizes a different rhetoric concerning the social authority of maps that is not based on the traditional discourse of scientific realism, or the regulatory institutions based in sovereign powers of the state (cf. Crampton, 2003). The Geoweb is socially constructed around mobilizing locally situated knowledges, and volunteered or crowdsourced epistemologies of place (Elwood *et al.*, 2012; Elwood, 2008; Brabham, 2013). This is significant because while many key aspects of knowing capitalism revolve around harvesting transactional data from government and commercial databases, entirely different sets of data produced through cultures of 'prosumption' may undermine or possibly enhance the analytical power realized from such transactional knowledge (Beer 2009; Beer and Burrows 2013; Ritzer and Jurgenson 2010). In turn, it poses important questions on the agential and subjective rhetorics of Geoweb data production.

Goodchild (2007) proposes the term "Volunteered Geographic Information" (VGI), to denote the production of geographic information by private citizens with little to no expertise in GIS or cartography. Goodchild focuses on websites and social media platforms that leverage interactive maps to allow individuals to label, name, or describe specific places, such as Wikimapia.<sup>4</sup> Instrumental to this new 'democratization' of GIS is the development of new protocols and tools for georeferencing, such as the emergence of Global Positioning Systems (GPS) that are now routinely embedded in many everyday new media devices such as smartphones and cameras, as well as new methods for 'geocoding' and 'geotagging' the Earth's surface that leverage vernacular 'folksonomies.' For Goodchild, one of the most significant contributions VGI can make is its emphasis on producing knowledge about local places and activities that may go unnoticed by institutional authorities such as the state or the media. For Elwood *et al.* (2012), the epistemological foundations of VGI derive their value from principles



similar to user-generated crowdsourced principles of collective intelligence in that the knowledge is often asserted rather than authoritative. That is, the knowledge produced through volunteered practices contains no inherent guarantee of validity or reliability, but instead is valued for its underlying principles of social production that stress the authenticity of perception and experience by local populations whom volunteer their phenomenological knowledge for collective action. The specific nature of volunteerism has been the cause of some disagreement in Geoweb scholarship. Tulloch (2008) argues that VGI contain inherent similarities to earlier forms of social cartography such as Public Participatory GIS (PPGIS). In this respect such cartography is not necessarily new, but instead has been an ongoing concern within various discussions of GIScience and critical epistemologies of GIS since the mid 1990s (see also Elwood, 2008; Sieber 2006).

The social cartography of Geoweb data is valued for its capacity to critique the hierarchical privileges of scientific and state authority derived from traditional cartography by offering more democratic forms of information literacy. For some, this means that the Geoweb is imbricated with the rise of the 'citizen sensor' whereby users of geospatial tools are embedded in vernacular regimes of geo-coding. This could include the routine disclosure of mobility patterns through mobile geo-locative media, such as geo-referenced hashtags which offer new possibilities for vernacular knowledge and interactivity (Goodchild 2007; Wilson 2012; de Souza e Silva, 2006). Thus, new forms of the cartographic data are premised on creating new geocoded subjects and notions of selfhood informed by interpretive socio-spatial frameworks. The Geoweb requires a reconfiguration of spatial perception and awareness guided by instrumentalized rationales of spatial experience. Wilson (2011), for example, examined volunteer geocoding programs in urban slums that recruited volunteers to assess and itemize various kinds of deviance, such as graffiti, overturned shopping carts, litter, and damaged public infrastructure. This effectively amounts to developing new perceptions of urban space to manage deviance by identifying specific sites of abnormal behaviour to guide future biopolitical policies.

Although such research is in its nascency, future work could be done to ascertain the extent to which everyday analytical frameworks of spatial perception are increasingly geocoded to specific institutional norms of neoliberal urbanization. This would suggest that the Geoweb might in effect reinforce the normalizing gaze of surveillance for biopolitical governance. Rather than producing new forms of spatial knowledge that empowers local groups, it could also be deployed to sanitize space from aesthetic differences inscribed by socio-economic neoliberalization. This theory has been developed extensively by critical urban geographers who have studied the reconfigured 'splintering' of urban infrastructures (Graham and Marvin 2001; Graham and Wood 2003; Graham 2004).

What is important is to consider the underlying social relations of data production. The Geoweb is significant because it can leverage open data sources and non-expert forms of social production. This suggests that public institutions no longer represent primary producers of spatial data. Curry (1998: 88) argues that 'we no longer own our own location' to highlight the replacement of institutional cartographic expertise by privatized epistemologies. This shifts

norms of ownership, particularly by 'leasing' out data and analytical power to government (sometimes, ironically, by purchasing public data at a discount), enabling scalable forms of neoliberal privatization of geo-spatial tools and data by the private sector that was once the domain of the state (Zook and Graham, 2007). This places severe challenges for leveling socio-economic inequalities, particularly as institutions of property become part of the fabric of cyberspace (see also Zittrain, 2008).

At the same time, governments and municipal bodies have invested in open data portals to allow easy and free access to various data streams, usually to optimize government services (Johnson and Sieber 2011; Sieber and Johnson 2015).<sup>5</sup> Longo (2011) argues that open data portals for government offer a three-pronged benefit for developing new forms of governance and civic participation, including the development of third-party citizen services; the expansion of policy networks for knowledge creation; and the potential for open data to increase the transparency and accountability of government. However, others argue that open data will not absolutely lend itself to such objectives, as it is still possible that existing digital divides and socio-economic conflicts might curtail some of the idealist principles of open data. This effectively raises concerns that those most pre-dispositioned to exploit open data are in fact highly trained experts in GIS and the private sector. It may eventually become necessary to expand some of the underlying conventions of social production in open data and the Geoweb to address more substantial matters of data literacy. Gurstein (2011), for example, argues for developing 'effective data use' policies to ensure a myriad of political and social objectives.

### **Political Economies**

We may have good reason to believe that the cultural aspects of social cartography and the underlying epistemological frameworks of the Geoweb will enable a diverse set of stakeholders to develop new spatial epistemologies. A complete history of this is well beyond our scope here. What is worth highlighting is that there have been very few studies that have sought to embed the Geoweb within larger frameworks of political economy and critical theory (Elwood and Leszczynski 2011; Elwood 2008; Smith 2014). Leszczynski (2012) argues that the Geoweb is historically contingent upon larger shifts towards the neoliberalization of the state and spatial infrastructures. For Leszczynski, the Geoweb did not simply emerge out of Web 2.0 trends, but follows a genealogy of market liberalization away from a strictly state-controlled domain towards the creation of geo-spatial media as a new mass market for the private sector. Despite the creation of open and free tools such as [openstreetmap.org](http://openstreetmap.org), the vernacular aspects of the Geoweb are dominated by commercial companies, and ripe for commercial exploitation. Another example is [upmystreet.com](http://upmystreet.com), now owned by the property company Zoopla in the UK. We pay attention to intellectual property regimes and ownership, and especially companies like Google whom exert significant pressure on the social relations of geospatial knowledge production through strategic acquisitions to maintain market control (Smith 2014).

The Geoweb emerged from a historical trend towards spatial data liberalization in the 1990s, and from the development of technical and organizational data standards by key geographic agencies of the United States government. The Geoweb can be traced back by analyzing the

creation of the National Spatial Data Infrastructure (NSDI) by the Federal Geographic Data Committee (FGDC) in the United States. The FGDC and the NSDI sought to instill laissez-faire free market principles onto domains once exclusive to government, including geo-spatial infrastructure. In the 1970s the United States government recognized the trend towards digitizing cartographic data, but also found evidence of overlap and redundancy. The Federal Interagency Coordinating Committee on Digital Cartography (FICCDC), which included representatives from the Departments of Agriculture, Commerce, Defence, Energy, Housing and Urban Development, State, Transportation, Federal Emergency Management Agency, and National Aeronautics and Space Administration, was charged with developing an organizational framework for digitalizing cartographic information. By the 1990s the FICCDC was transformed into the FGDC, and called for the development of a 'resource' to maximize the efficient production, distribution, and use of geospatial data. This resource was to become known as the National Spatial Data Infrastructure (NSDI).

In 1994, President Clinton launched the NSDI through executive order #12906, which was later amended by President Bush in 2003 by Executive Order #13286 to include the Department of Homeland Security. According to President Clinton, the NSDI is part of a larger program to 'reinvent government,' especially in a time where visions of the information 'superhighway' were abounding all levels of government. Executive Order #12906 sets forth the development of a publicly accessible geographic data clearinghouse in an effort to harmonize data standards and reduce governmental waste. The NSDI explicitly acknowledges the role of networked computers and communication in producing and consuming cartographic maps. The NSDI's primary purpose is the social and technical framework for organizing the use of geospatial data amongst a variety of sectors, and specifically addresses the need for non-governmental actors to play a key role in the future production of geo-spatial data. The NSDI Cooperative Agreements Program (CAP) in particular sought to leverage the private sector and other non-federal governmental agencies through a merit-based granting system. The CAP has issued over 700 grants since 1994 to maximize digitization of geospatial data by leveraging the private sector. Since May 2007, in Europe, there has been in place a legal framework to mandate the creation of a European SDI at national levels<sup>6</sup>.

Understanding governance structures has historically been a key technique for analyzing the power relations that structure the production of particular media content. While new technologies are rapidly emerging, the generic components underpinning the Geoweb are relatively constant: framework data, metadata, interoperability, praxis, access, user-groups, imagery and scale. Key differences are in the approach, institutional and/or commercial scope and ambition. The standards for data infrastructure are also very similar (see Craglia, 2007). The Open Geospatial Consortium (OGC), for example, is a powerful standards setting organization that seeks to develop the potential of geospatial content for both industry and government. Without the OGC's role in standards setting, it is questionable whether something like the Geoweb could ever really exist. The OGC's governance structure is an excellent example for understanding the inter-relationship between industry and government in the production of information standards and infrastructures, or put another way, for understanding the political economy of geospatial media.

The OGC is a private sector based standards organization that emerged out of military divestment. The vast majority of members are from the private sector, and indeed if OGC members are ranked in terms of influence and power, we find a handful of powerful American corporations at the top tier, including private defence contractors and large tech companies. Although the standards themselves are open in that they are free to use or modify for any purpose, the actual capacity of determining standards is much more complex and demonstrate an emphasis on allowing the private sector, as well as key US government agencies, to have a substantial role in determining the overall direction and scope of Geoweb standards. This can largely be explained by once again taking into consideration the long-term historical direction of geospatial development, particularly the NSDI's role in stimulating the private sector in establishing a market for geospatial media.

The political economy of the Geoweb is important because it draws attention to how the Geoweb is embedded in both the rise of commercial sociology and simultaneously the decline or withdrawal of state resources in cartographic knowledge production. This neoliberalization of geo-spatial infrastructure operates on numerous levels, including the diffusion of expertise towards 'non-expert' vernacular understandings of space and place; the creation of crowdsourced epistemologies whereby Geoweb users contribute or labour in various forms of social production; and finally in the politics of geo-spatial infrastructure. Significantly, the changing institutional governing bodies of spatial data standards such as the OGC are governed by an assemblage of public and private entities typically based in the United States.

### **Part III: Applications**

It is important to realize that map making has typically been employed to address issues of population management, and therefore directly intersects with sociological knowledge production. A classic example is the epidemiological maps of cholera outbreaks in London that were juxtaposed by the locations of public water pumps by John Snow. Another example is the London poverty maps created by Charles Booth that drew strong correlations between poverty and health. Such rationales for mapping eventually went on to influence the development of the Chicago School of Sociology, which in turn became a key pillar in the foundation of geodemographics, and then ultimately of relevance here, towards the use of GIS for knowing capitalism.<sup>7</sup>

Elwood and Leszczynski (2013) argue that the significance of the Geoweb is the underlying knowledge politics and epistemological strategies of validity and authority enacted by new mapping practices. They view the Geoweb as offering the ability to resituate geovisual epistemologies around as an exploratory engagement with content, rather than simply being used for cartographic abstraction and representation. Underlying these epistemological strategies are entirely different sets of criteria necessary for engendering claims of reliability and validity—criteria that are not necessarily grounded in methodological claims of normal positivist science, but instead around transparency, peer-verification, and 'witnessing'. The

Geoweb's capacity for creating new tools and methodologies for social science research is in this sense seen as embedded within larger cultural epistemologies of praxis whereby interfaces of social cartography is equated with democratic and civic change. However, we should not assume that the Geoweb (and its ancillary institutions of open data and crowdsourcing) is developed exclusively by marginalized communities. The interactive properties of Geoweb mapping is situated in heterogeneity of political or social goals. In some cases, this is not exclusively accomplished by one specific user, but could be crowdsourced by a multitude of networked users guided by more or less coherent objectives of social change.

*Ushahidi*, for example, is a free and open source non-profit crisis mapping company that leverages principles of the Geoweb and crowdsourcing to create activist mapping for social justice issues worldwide. The Swahili name for testimony, Ushahidi was created in the aftermath of the 2007 Presidential elections in Kenya that created a Google map of eyewitness reports of violence collected from e-mail and mobile SMS reports from on the ground testimony. Since then, Ushahidi's mission statement has been to 'change the way information flows in the world, and empower people to make an impact with open source technologies, cross-sector partnerships, and ground-breaking ventures,' and has been used in numerous humanitarian missions wrought through political conflict, war, or natural disasters such as the 2010 Haiti earthquakes (Ushahidi, 2015). Ushahidi also offers a suite of other products for crisis mapping and disaster response, including: Ping<sup>8</sup>, a check-in tool for emergencies; CrisisNET, a consolidated source of crisis data;<sup>9</sup> and even manufactures hardware for rugged conditions such as BRCK, a self-powered mobile wifi router.<sup>10</sup>

For Roche (2013), the Geoweb has now become an indispensable part of crisis management because it offers the capacity to centralize the dissemination of information from both authoritative and non-authoritative sources. These affordances for crisis management, however, have begun to stimulate new discussions around the role of 'victim' epistemologies and how such information may enhance or sometimes complicate the institutional processes of crisis management by authorities, but, more importantly, might also risk placing new burdens on victims of these crises to stay connected to various data sources in real time in order to seek assistance or relief. Thus, while crisis mapping tools may create new affordances that enhance the efficiencies of aid and rescue, it may also place new responsibilities on individual victims of these events to self-manage crisis, effectively re-inscribing neoliberal individualizations of risk management (Bauman 2001; Beck 1999).

A further application of the Geoweb that may be of value for realizing new avenues for social science research is from *SaaS* platforms developed by the private sector that offer easy to use geo-spatial tools and interfaces for web browsers by exploiting cloud computing storage (see Mosco (2014) for a discussion on the political economy of cloud computing). CartoDB serves as an excellent case in point primarily because it operates under a 'Freemium' business model so that anyone can begin to use the platform but may eventually need to pay licensing fees to take fuller advantage of more powerful analytical tools. Of particular interest is the ability to integrate datasets from commercial providers, including social media platforms such as Instagram (now owned by Facebook), marketing datasets from Salesforce, or data from

traditional GIS tools such as ArcGIS. The functionality and user interface of CartoDB is in many respects remarkable as it could allow anyone to produce sophisticated analytical maps, such as choropleth and animated torque maps, with very little difficulty. It furthermore offers more advanced users tools such as Cascading Style Sheets (CSS) and Structured Query Language (SQL) editing panels for a greater degree of precision, control, and finesse over created maps. A social scientist with little-to-no training in GIS could, in theory, download a dataset from any open data portal; import their data into a CartoDB map, and manipulate the data through various data 'wizard' tools within minutes to test their hypotheses.

CartoDB serves a multitude of markets and applications, including banking and finance, education and research, journalism and media, as well as non-profit sectors. CartoDB is scalable to its clientele, offering numerous pricing models from 'free' to enterprise solutions from \$9,000 USD/year. This is significant because it underscores the underlying neoliberal political economies of the Geoweb with regards to its profound connections to commercial empirical sociology, but also may offer grassroots community organizations the potential to use these tools for minimal to no cost. In other words, the pricing models and scalability of Geoweb infrastructures such as CartoDB (which is connected to external datasets and the cloud) reflect and potentially reinforce socio-economic differences and conflicts. It moreover demonstrates how the Geoweb is not simply a cultural epistemology of social production that exclusively serves an idealization of networked publics—it is highly commodifiable and scalable to meet a heterogeneity of agendas and interests. The promise of accessibility, interactivity, and ease becomes dependent on access to capital and labour necessary for leveraging more complex tools, data sets, and analytical power.

## **Discussion**

The Geoweb in its most idealized form presents social scientists with the capacity to engage with geo-spatial interfaces and datasets in ways never before imagined, and without possessing certain data literacies of GIS. It can, and probably will, become integrated into the repertoire of 'normal' social science methods. This represents a significant benefit that provides new tools to visualize complex socio-demographic phenomena, and can perhaps allow social scientists a realization of new kinds of analytical knowledge.

At the same time, the political economy of the Geoweb suggests that market imperatives of commercial sociology will exact a strong influence on the overall scope of cartographic production. Here, access to capital - both economic and intellectual - will in all probability reinforce distinctions of authority and expertise despite the ideological assumptions of the Geoweb with respect to democratization, accessibility, and empowerment. In this respect, the capacity to create and interact with geospatial data through these new interfaces cannot be framed exclusively as a grassroots method for crowdsourced forms of social production and praxis, as the private sector arguably remains the primary consumer in this market. Moreover, data licensing, standards, and the increasing move towards cloud-based SaaS indicates that the Geoweb's connections with social praxis may indeed be a legacy that is eventually being replaced by the imperatives of the market—a history not unfamiliar to new media as a whole.

Commodification, commercialization, and control over both the social relations of data production, and the underlying technological modes for retention and analytics are therefore perceived to become a necessary priority for future research in the Geoweb.

This chapter has sought to re-evaluate some of the key arguments forwarded in the first edition concerning the status of empirical sociology and the jurisdictional questions engendered by knowing capitalism. The Geoweb was identified as a key development in social cartography and was analyzed by comparing its cultural epistemologies and its embeddedness in neoliberal political economies of geo-spatial infrastructure. It then offered a brief comparison between two Geoweb platforms that arguably exemplify its cultural and commercial potential. It is worth considering how digital maps might begin to become part of the routine set of methods sociologists could mobilize for conducting empirical research, as the declining necessity for expertise in GIS might offer sociologists new avenues for engaging with empirical and quantitative data. This may in effect permit a greater degree of interdisciplinary discussion between for example, sociology and geography. At the same time, the Geoweb does not absolve the crisis of empirical sociology, nor is it entirely clear the extent to which jurisdictional challenges posed by knowing capitalism are being sufficiently addressed. Issues around data literacy and expertise remain at the foreground of intellectual labour, but the Geoweb, as this chapter hoped to argue, shows how the flow of power is not unidirectional or necessarily detrimental to the future of empirical sociology.

## Notes in the Text

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<sup>1</sup> This chapter is dedicated to the memory of Mike Hardey, who died on 27th March 2012. In the first edition this chapter was titled 'Cartographies of Knowing Capitalism and the Changing Jurisdiction of Empirical Sociology' and was co-authored by Mike and Roger Burrows. For this new addition we have invited Harrison Smith to substantially update the chapter, and also Mariann Hardey - Mike's daughter and a social media scholar – to provide additional input. We hope the resulting chapter remains true to the ethos, interests and concerns that Mike had throughout his career. Both Mariann and Roger sorely miss him.

<sup>2</sup> What some have recently termed 'digital civics': <http://digitalcivics.org.uk/>.

<sup>3</sup> In a UK and Australian context for certain, but perhaps also now in Scandinavia and Canada as well? Mainstream sociological research practice has always been more quantifiably inclined in the USA and Japan, but even here there is some evidence that the balance between qualitative, quantitative and supposed 'mixed-methods' research design are shifting.

<sup>4</sup> See <http://wikimapia.org/>.

<sup>5</sup> See [data.gov](http://data.gov) for an example of a large-scale open data repository from the United States Government. Similar open data portals are found at all levels of government throughout the world, but particularly in developed nations.

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<sup>6</sup> This legal framework is called INSPIRE, and Infrastructure for Spatial Information in Europe ([www.ecgis.org/inspire](http://www.ecgis.org/inspire)).

<sup>7</sup> For a more detailed history of maps, see Pickles (2004); Wood (1992; 2010); Curry (1998); Crampton (2009).

<sup>8</sup> See <http://www.usahidi.com/product/ping/>

<sup>9</sup> See <http://www.usahidi.com/product/crisisnet/>

<sup>10</sup> See <http://www.usahidi.com/product/brck/>

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